



Arts & Humanities  
Research Council

## **Antimicrobial Resistance (AMR) in the Real World – Announcement of Opportunity (AO) for Pump Priming Grants**

**Closing date: 16:00 3 December 2015**

### **Summary**

Antimicrobial Resistance (AMR) in the Real World is a £6.5m programme under the AMR Cross-Council Initiative. This call is co-funded by the Natural Environment Research Council (NERC), the Biotechnology and Biological Sciences Research Council (BBSRC) and the Medical Research Council (MRC), and has potential co-funding from the Arts and Humanities Research Council (AHRC).

The programme will support two types of award; larger Research Grants and smaller, more focused, Pump Priming Grants. This Announcement of Opportunity (AO) is for the Pump Priming Grants which will be limited to a maximum of £200k (100% FEC) per project for 12-36 months. A previous call was released for Outline Research Grants.

This programme aims to address the need for a greater understanding of the role of the outdoor environment and host microbiome in influencing the evolution, acquisition and spread of antibacterial resistance, and acting as a reservoir for resistance. The programme is restricted to antibacterials and resistant bacteria or bacterial resistance genes, of clinical and/or veterinary importance. Research supported can be based in agricultural, aquaculture, wastewater and natural environments (and their interfaces), the human and animal host microbiome, and also includes elements of the way people and human communities interact with the environment. Applicants are encouraged to take an interdisciplinary approach and consider appropriate partnerships. We now invite applications to this call.

A town meeting, where applicants can gain additional information and discuss their potential proposals with the funders and potential collaborators and end users will be held in London on 11 September 2015.

### **1. Background**

#### *1.1 Strategic background*

AMR is recognised as one of the most important global issues for human and animal health. There are increasing numbers of resistant infections, many existing antimicrobials are becoming less effective, and there is rapid spread of multi-drug resistance. This means that we could be close to a reality where we are unable to prevent or treat everyday infections/diseases. Furthermore, there is a lack of significant commercial innovation in antimicrobials. Part of the research challenge must therefore be to conserve the antimicrobials we have left by understanding and mitigating the development of resistance. To develop a complete picture we need to understand the role of the

outdoor and host environments in the development and transmission of AMR, an area where there has been very little co-ordinated research effort to date.

The UK Government has published a Five Year Antimicrobial Resistance Strategy<sup>1</sup> (2013-2018) that sets out the actions and research needed to tackle AMR. Both the Government's AMR Strategy and the Science & Technology Select Committee's recent report on Ensuring Access to Working Antimicrobials<sup>2</sup>, have highlighted the need to understand AMR in the real world, and the Select Committee's report recommends "a research programme that will recruit expertise across the UK to fill the knowledge gaps on how antimicrobial resistance exists and may be transmitted via environmental routes".

## *1.2 Call background*

The AMR Funders' Forum (AMRFF)<sup>3</sup> and the AMR Cross-Council Initiative<sup>4</sup> have been created to enable the interdisciplinary research required to address the issue of AMR.

The AMR Cross-Council Initiative is led by MRC on behalf of the Research Councils and will be delivered via a thematic approach with research commissioned under four themes:

- Theme 1: Understanding resistant bacteria;
- Theme 2: Accelerating therapeutic and diagnostics development;
- Theme 3: Understanding the real world interactions;
- Theme 4: Behaviour within and beyond the health care setting.

A phased approach to delivery is being taken with the timing of calls under each of the themes being determined on a case-by-case basis. To date, the AMR Initiative has committed £28.5m to new research activities and the total investment will increase as new activities are commissioned.

This call, AMR in the Real World, falls under Theme 3 (Understanding the real world interactions) of the AMR Cross-Council Initiative. Theme 3 aims to address the need for a greater understanding of the role of the bacterial environment, defined in the broad sense (including host microbiomes), in influencing the evolution, acquisition and spread of antibacterial resistance, and as a reservoir of resistance. This programme is focused on AMR in outdoor environments and the host microbiome, but the Research Councils also recognise the importance of understanding AMR in indoor environments, such as hospitals and homes, and the Arts and Humanities Research Council (AHRC) are coordinating a scoping exercise to determine the research priorities in this area.

NERC are leading this programme on AMR in the Real World on behalf of the Research Councils. The research priorities for the programme were defined by two workshops in 2014 on AMR in the environment (specifically the outdoor environment) and AMR in the context of the host microbiome (both human and animal). These areas are being brought together to build the interdisciplinary science which is required to address the issues. This is a £6.5m programme co-funded by NERC (£3.5m), BBSRC (£2m) and MRC (£1m). In addition, AHRC will contribute on a case-by-case basis to successful projects with an arts and humanities component.

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<sup>1</sup> <https://www.gov.uk/government/publications/uk-5-year-antimicrobial-resistance-strategy-2013-to-2018>

<sup>2</sup> <http://www.publications.parliament.uk/pa/cm201415/cmselect/cmsctech/509/50902.htm>

<sup>3</sup> <http://www.mrc.ac.uk/research/initiatives/antimicrobial-resistance/antimicrobial-resistance-funders-forum/>

<sup>4</sup> <http://www.mrc.ac.uk/research/initiatives/antimicrobial-resistance/tackling-amr-a-cross-council-initiative/>

## 2. Grant requirements

**Pump Priming Grants should be no more than £200k (100% FEC), for 12-36 months, intending to start no later than 1 May 2016 and complete by 31 March 2020.**

### 2.1 Programme scope

This programme aims to address the need for a greater understanding of the role of the outdoor and host microbiome in influencing the evolution, acquisition and spread of antimicrobial resistance, and as a reservoir for resistance.

This programme is restricted to antibacterials and resistant bacteria or bacterial resistance genes, of clinical and/or veterinary importance, and excludes antibacterial resistance in plant pathogens.

Research supported can be based in agricultural, aquaculture, wastewater and natural environments (freshwater, marine, soil, air, etc. and their interfaces), human and animal host microbiomes (including the gut, skin, respiratory and oral microbiomes) and also includes elements relating to the way people and human communities interact with the environment, animals and each other. Research based in the indoor environment (e.g. looking at surfaces in hospitals) is outside of the scope of this programme.

As it will not be possible to cover the full scope of the programme within a single project it is expected that supported projects will focus their research questions around specific locations, specific antibacterials and/or specific bacterial communities, however applicants should set-out how the approaches and methodologies developed could be translated to other environments, antibacterials or other bacterial communities.

Proposals that include research within the remit of more than one of the funders are welcome. AHRC will consider funding on a case-by-case basis proposals with an arts and humanities component. Areas of interest to AHRC are briefly outlined within the work packages below but further detail of approaches and possible research questions are detailed in Annex 1. As the environmental science elements of this call are predominately in Work Package 1, it is expected that at least £3m of the NERC contribution to the programme (£3.5m) will be invested in this work package.

A key aim of this programme is to develop a community of researchers with the broad range of skills and expertise needed to understand the evolution, acquisition and spread of antimicrobial resistance. This will include learning from and building on research in related areas, and applications from researchers who have not worked on AMR previously but have experience in relevant disciplines, such as environmental microbiology, gut microbiology, bacteriology or arts and humanities, are encouraged as the funders are keen to expand the AMR research base in the UK.

### 2.2 Grant scope

This call for Pump Priming Grants has the same science scope as the call for Research Grants, but proposals will be expected to have a narrower focus than the larger Research Grants, and so may address only part of one of the key objectives identified under each work package (see section 2.3).

This call aims to support untested, high risk/high reward research that will provide new insights, be transformative and stimulate creative thinking to tackle AMR in the real world. The proposed research project should be novel, innovative and exploratory. Innovative research may introduce a

new paradigm, challenge existing paradigms, look at existing problems from new perspectives, or exhibit other highly creative qualities. Proposals could bring new collaborations and different disciplines/approaches together. Successful proposals are expected to generate robust data which will lay the groundwork for future avenues of scientific investigation.

Pump Priming Grants are not intended to support a logical progression of an already established research project or other types of on-going work; therefore, the nature of this award would be more exploratory. The proposed research project should include a well-formulated, testable hypothesis based on a sound scientific rationale and study design. No preliminary data is required but may be included if available.

Interdisciplinarity and partnership working are important to the AMR in the Real World programme and therefore are encouraged wherever possible and appropriate in Pump Priming proposals.

Early career researchers are particularly encouraged to apply (providing they meet the eligibility requirements referenced in section 2.5) as the scope of the Pump Priming Grants is not dependent on a long track record.

### *2.3 Scientific objectives*

There are two work packages as part of this programme. Proposals can address either Work Package 1 or Work Package 2, or can work across both work packages. In all cases applicants must clearly demonstrate how their project will deliver against the objectives of the relevant work package(s).

#### Work package 1

**Within this work package, we specifically want to advance understanding of the acquisition, spread and evolution of AMR in the environment and to determine how this affects exposure risks for humans/animals.**

Applicants must address one or more of the following three issues:

1. Understanding sources, presence, location, transport, fluxes, transformations and eventual fate of antibacterials in the environment, at an appropriate spatial and temporal scale, and relating this to usage and professional practices.
2. Understanding presence, location and levels of resistant bacteria and/or resistance genes in the environment (including measures of abundance, not just presence/absence) and how these genes are transferred within and between microbial communities (including non-pathogenic bacterial communities) and the rate at which they do so. Applicants should identify the implications for pathogens of clinical and/or veterinary importance.
3. Developing a quantitative understanding of the processes and factors that control the selection of AMR genes in the environment, including:
  - emergence of resistance (including via novel mechanisms);
  - persistence/retention (including both survival and fitness effects);
  - transfer;
  - evolution; and
  - co-selection.

This work should identify the specific environmental drivers of these selection processes, including both anthropogenic and non-anthropogenic drivers. The work should also include identifying the implications for pathogens of clinical and/or veterinary importance.

Within the projects applicants could also begin exploring how their research can inform AMR policy and management strategies. The range of research of relevance to policy is broad and some examples are listed below, note that this list is not exhaustive and research in other areas that can contribute to policy development is also welcome:

- Predict the exposure risk to humans/animals (including identifying hotspot locations for exposure and locations susceptible to emergence of resistance) and the corresponding implications for health. How the presence of humans/animals plays a part in the acquisition, spread and evolution of AMR in the environment could also be considered.
- Explore potential interventions and mitigation strategies, including new strategies, which minimise the emergence, transmission, and/or exposure risk of resistance in the environment in a cost-effective, sustainable way. Potential interventions could include physical solutions to prevent the spread of antibacterial resistance and suggested changes in environmental, agricultural, veterinary and medical management practices. Proposals that consider cultural factors around different practices (including professional practices) and community contexts, for example exploring participatory approaches to co-design interventions with diverse communities or using visualisation, narrative and/or creative arts approaches to engage diverse communities, are eligible to apply. Identifying or developing new antimicrobials or the design and use of indoor environments is outside the scope.

## Work package 2

**Within this work package, we specifically want to advance understanding of the acquisition, spread and evolution of AMR in the host microbiome (human and animal), and the potential role of the environment in this.**

Research proposals should aim to develop an understanding of AMR genes and resistant bacteria in the context of host microbiomes, through one or more of the following:

- interactions between resistant bacteria and the wider microbial community in the host (including gut, skin, oral, respiratory, etc.);
- specific drivers of the emergence, evolution and co-selection of resistance;
- persistence/retention (including both survival and fitness effects);
- how resistance genes are transferred within the microbiome, including pathogenic and commensal bacteria;
- the influence of the 'outdoor' environment on these and the interaction between the host and the environment.

Applicants should identify whether the presence of resistant bacteria or resistance genes in the host microbiome has implications for pathogens of clinical and/or veterinary importance.

### *2.4 Non-scientific objectives*

Proposals will address the following objectives:

#### 1. Interdisciplinary collaborations

Attracting new disciplines to the field of AMR research is a key goal for the over-arching AMR Cross-Council Initiative. Therefore, applicants should consider appropriate collaborative partnerships between disciplines to tackle this research. However, the funders acknowledge that the breadth of the interdisciplinarity might be limited by the available funding for Pump Priming Grants and thus only request that applicants give this issue due consideration in their proposal.

## 2. Partnerships

The funders encourage projects to engage with potential partnerships, where appropriate, to ensure that the research proposals are designed to provide the evidence needed to support policy/regulators and/or industry. There should also be a consideration of the antibacterial prescribers and users, including farmers, veterinary and medical practitioners, and the public. Appropriate involvement of such partners could be part of the project design in order to ensure appropriate pathways to impact.

Where appropriate, applicants could include partnership activities with new or existing partners and align with on-going activities to develop new ways of working. Some organisations who have indicated in advance a desire to partner with applicants to this call can be found in Annex 2. **There is no obligation to include any of the partners listed in Annex 2 and the inclusion of partners in organisations not included in Annex 2 is also encouraged. Co-funding from industry/policy partners is not a prerequisite for this call.**

The funders recognise that the more speculative/blue skies proposals may be limited in terms of the relevance to partners. It is legitimate for applicants to state this but the funders expect that the possibilities of relevant partnerships are explored and applicants mention any follow on activity which might occur from any future work after this proposal and which might be more relevant.

### *2.5 Eligibility*

All applicants must meet the organisation eligibility requirements of at least one of the funding organisations (AHRC, BBSRC, MRC or NERC), see <http://www.rcuk.ac.uk/funding/eligibilityforrcs/> for details of eligibility requirements of each of the councils. Eligibility criteria for investigators are given in the NERC grants handbook<sup>5</sup>.

Investigators may be named on a maximum of two different Pump Priming Grant proposals but only one as the lead Principal Investigator. It is the responsibility of the lead PI to ensure that your proposal does not include ineligible Co-Is and Researcher Co-Is, or any applicants who are named on more than two proposals. Proposals which break this eligibility rule will be rejected. Applications to the Research Grant call will be counted separately to the Pump Priming Grants call.

### *2.6 Studentships*

No associated studentships are permitted.

## **3. Process and assessment**

### *3.1 Overview of programme delivery*

This AO for Pump Priming Grants is part two of the programme AMR in the Real World. This call has the same closing date as the full stage of the larger Research Grants, and the Pump Priming Grants will be reviewed by an expert Assessment Panel at the same time as the Moderating Panel for the Research Grants.

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<sup>5</sup> <http://www.nerc.ac.uk/funding/application/howtoapply/forms/grantshandbook/>

### *3.2 Town Meeting*

Given the complexity of the research challenges addressed by this programme, and the need to develop new partnerships and collaborations, the funders will be holding a Town Meeting on 11 September 2015. This will provide the opportunity to hear more from the funders of this call, network across the various disciplines, identify potential collaborators and stakeholders, and to discuss areas for potential applications. Individuals interested in either the Research Grants or the Pump Priming Grants are actively encouraged to take part in the Town Meeting, but participation in this meeting is not a requirement of call.

### *3.3 Programme coordination and integration*

Following the award of grants, additional funds will be available to deliver activities designed to improve integration and coordination of research efforts (such as synthesis activities and science meetings) but also carry out Knowledge Exchange, impact and innovation activities. This will be across the projects in this programme but also link with the other themes of the AMR Cross-Council Initiative where appropriate. This activity will specifically facilitate interdisciplinary and whole system working.

### *3.4 Application process for this call*

#### 3.4.1 Basics

Applications must be submitted using the Research Councils Joint Electronic submission system (Je-S). Please select the Scheme – ‘NERC/Standard Proposal/Directed/AMR in the Real World Pump Priming Grants’. To use this system, the applicant’s Research Organisation must be registered as a Je-S user. Full details are available on the Je-S website (<https://je-s.rcuk.ac.uk/JeS2WebLoginSite/Login.aspx>). Further information can also be obtained by contacting the Je-S Helpdesk by email [JeSHelp@rcuk.ac.uk](mailto:JeSHelp@rcuk.ac.uk) or by telephone on 01793 444164 (Monday to Friday 8:30 – 17:00).

Applicants must ensure that they submit by **16:00 (4pm) 3 December 2015**. Applicants should leave enough time for their application to pass through their organisation’s Je-S submission route before this date. Any application that is received after the closing date, is incomplete, or does not meet the eligibility criteria will be returned to the applicant and will not be considered.

All attachments submitted through the Je-S system must be completed in single-spaced typescript of minimum font size 11 point, Arial font, with margins of at least 2 cm. It is very important to note that from January 2015, NERC has updated its position on adherence to grant rules<sup>6</sup>. **This means that any applications which fail to adhere to the page lengths of documents, font size, the specified start date, etc. will automatically be rejected and there will be no opportunity for amendment or appeal.**

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<sup>6</sup> <http://www.nerc.ac.uk/latest/news/nerc/grant-regs/>

### 3.4.2 Application guidance

The proposal will consist of a proforma plus attachments:

- Case for Support incorporating the Previous Track Record (up to 2 sides A4), the Description of Proposed Research (up to 3 sides A4) (total document length = 5 sides A4). [mandatory]
- The Outline Data Management Plan (ODMP, up to 1 side A4) (see section 3.4.4). [mandatory]
- Justification of Resources (up to 2 sides A4). [mandatory]
- Pathways to Impact (up to 2 sides A4) (see section 3.4.5). [mandatory]
- CVs for all Principal and Co-Investigators, named research staff (including Researcher Co-Investigators) and Visiting Researchers (up to 2 sides A4 for each CV). [mandatory]
  
- Letters of support from any named Project Partners, the date of these must be within six months of the submission date (up to 2 sides A4 each). [if necessary]
- Facility Forms – Use only for application forms for Ship-time/Marine Equipment (SME), Antarctic Logistics Support and for High Performance Computing (HPC) when use of ARCHER exceeds 160MAU (in any one year). [if necessary]
- Technical Assessment – Mandatory for any NERC Facility selected on the JeS proforma except those listed in the previous point. The attachment should be a quote from the relevant facility (see section 3.4.6). [if necessary]
- Equipment Section attachment – three quotations for each item of equipment requested over £25k and a Business Case (up to 2 sides A4) are required for equipment requests over the OJEU threshold limit<sup>7</sup>. [if necessary]
- Use of animals and/or human participants in research form (see section 3.4.7) to be uploaded as attachment type “other”. [if necessary]

Applicants are advised that they should convert their attachments to PDF prior to upload in order to avoid formatting issues.

### 3.4.3 Finances

Applicants should follow the financial conditions set out in Section E of the NERC Grants Handbook<sup>8</sup>.

### 3.4.4 Data management

NERC requires that strategic research programmes implement a data management scheme which covers practical arrangements during the programme and subsequent long-term availability of the data sets. In line with the NERC data policy<sup>9</sup> the data from the programme will be lodged with the appropriate NERC Designated Data Centre or other appropriate publically available data repositories. NERC puts an obligation upon PIs to ensure that data management is undertaken in a suitable way. Applicants are required to submit an outline Data Management Plan (ODMP), to identify the data sets likely to be available for archiving and reuse at the end of the grant. There will be no charge to the project for a NERC Data Centre to accept and manage the agreed data sets at the end of the grant but any in-project data management activities should be costed and included within the proposals. If proposals do include any costs for the Data Centre then these will be removed from the proposal. Further information is provided on the NERC webpages<sup>10</sup>. For any

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<sup>7</sup> <http://www.nerc.ac.uk/funding/application/howtoapply/forms/grantshandbook.pdf> see paragraph 45.

<sup>8</sup> <http://www.nerc.ac.uk/funding/application/howtoapply/forms/grantshandbook/>

<sup>9</sup> <http://www.nerc.ac.uk/research/sites/data/policy/data-policy.pdf>

<sup>10</sup> <http://www.nerc.ac.uk/research/sites/data/dmp/>



population or patient based studies, the applicants must comply with requirements for data management in the MRC Guidance for Applicants and Award Holders 2015 (section 4.2.6)<sup>11</sup>.

### 3.4.5 Pathways to Impact

NERC requires all grant proposals to include a Pathways to Impact plan, which should focus on engagement with users (industry, business, government, charities or the general public), specifically considering what will be done during and after the project to increase the likelihood of the research reaching the identified beneficiaries and maximise the likelihood of the identified benefits being achieved. Further information is given in point 185 of the NERC Grants Handbook<sup>12</sup> and on the NERC website<sup>13</sup>.

### 3.4.6 Services and facilities

Applicants may also apply for access to any of the RCUK services and facilities<sup>14</sup>. Prior to submitting the proposal, applicants must first contact the facility to seek agreement that they could provide the service required and obtain a technical assessment (quote). Applicants should contact the relevant facility at least one month prior to the closing date to ensure that the facility can provide the quote in time to be submitted with the proposal. Applicants should refer to the point 219 of the NERC Grants Handbook for further detail<sup>15</sup>.

### 3.4.7 Use of animals and/or human participants

For any proposals including the use of animals and/or human participants in research, the guidance in sections 8.2 and 8.3, respectively, of the MRC Guidance for Applicants and Award Holders 2015<sup>18</sup> must be followed. Applicants using animals and/or human participants are also required to complete and submit the template form in annex 3 (<http://www.nerc.ac.uk/research/funded/programmes/amr/news/ao-pggrants/annex3/>) as part of the application.

## 3.5 *Assessment process*

Proposals received prior to the deadline which fit the basic requirements of the call will be assessed by an Assessment Panel. Proposals will be assessed on Fit to Scheme (scientific and non-scientific objectives) and Excellence. Further information on scoring is provided on the NERC website<sup>16</sup>. The panel will look across the grants and assess the potential for the projects to deliver a balanced portfolio which address the programme objectives. The funders reserve the right not to fund up to the limit allocated to the programme, and will consider the overall balance of science needed to deliver the programme, in making decisions about which grants to fund.

Applicants will be given brief feedback from the Panel summarising the reasons why the proposal was successful/unsuccessful. No further feedback will be available.

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<sup>11</sup> <http://www.mrc.ac.uk/documents/pdf/guidance-for-applicants-and-award-holders/>

<sup>12</sup> <http://www.nerc.ac.uk/funding/application/howtoapply/forms/grantshandbook/>

<sup>13</sup> <http://www.nerc.ac.uk/funding/application/howtoapply/pathwaystoimpact/>

<sup>14</sup> <http://www.nerc.ac.uk/research/sites/facilities/>

<sup>15</sup> <http://www.nerc.ac.uk/funding/application/howtoapply/forms/grantshandbook/>

<sup>16</sup> <http://www.nerc.ac.uk/funding/application/assessment/>

#### 4. Timeline

AO for Pump Priming Grants launched	August 2015
Town Meeting	11 September 2015
Closing date for Pump Priming Grants and Full Proposal Research Grants	3 December 2015
Pump Priming Grants and Full Proposal Research Grants Panel	March 2016
Pump Priming Grants and Research Grants start	1 May 2016
All grants will have completed by	31 March 2020

#### 6. Contacts

Scientific queries, application process and general enquiries:

Daniel Knight

[amr@nerc.ac.uk](mailto:amr@nerc.ac.uk)

01793 411672

For queries on specific council remit please contact:

AHRC:

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MRC:

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## Annex 1

### Specifications of approaches and potential research questions of interest to AHRC

Proposals to this call with an arts and humanities component will be considered by AHRC on a case-by-case basis.

To fully understand the interaction between people, communities (including professional) and the environment and its role in AMR, the use of a wide range of approaches and methods could be utilised as part of arts and humanities research. This could include ethnography, creative expression, history, literature, design and the use of narrative and storytelling to understand the complexity of these interactions.

Research questions could include:

- Working with professional and local communities to develop more sustainable practices to help mitigate AMR development/emergence in the environment through for example:
  - o Improving understanding of changes in environmental, landscape and agricultural management practices, and public health over time and applying this to modern contexts;
  - o learning from past successes and failures in engaging communities (including professional communities) in this area;
  - o employing participatory approaches to co-design interventions with diverse communities;
  - o using visualisation, narrative and/or creative arts approaches to engage diverse communities in mitigation strategies focused around the interface and relationship between AMR and the environment;
  - o understanding the impact of cultural factors (historical perspectives, beliefs, cultural values, ethnicity) and cultural inequalities in developing (multi-level) intervention and mitigation strategies;
- What approaches are most effective in different groups?
- How sensitive is AMR emergence to community contexts, including the practices of professional communities?
- How can services be integrated in such a way to take into account the above factors to transform health practices and processes of user engagement?
- Understanding the take-up/scaling-up of interventions which work and how better understanding of cultural and professional practices and traditions can help more effective scaling up of interventions.

## Annex 2

### Potential project partners which applicants may wish to approach

Several organisations have expressed an interest in contributing resources to individual projects for this call. Applicants can approach any of these of relevance but are not obliged to include any of these organisations.

#### *Industry*

##### Agriculture and Horticulture Development Board (AHDB)

Where proposals are interested in systems of relevance to the pork, beef, lamb or dairy sectors, applicants may wish to approach AHDB for which they can provide access to strategic work of relevance, EU collaborative research groups and Knowledge Transfer avenues within the organisation. Please contact Martin Smith ([Martin.Smith@ahdb.org.uk](mailto:Martin.Smith@ahdb.org.uk)).

##### AstraZeneca

Where proposals seek to provide novel tools and approaches that could (i) underpin the prospective environmental risk assessment of antibacterials and associated antibacterial resistance and (ii) target retrospective environmental risk management and mitigation strategies for resistance that encompass the pressures of co-selection and fitness etc. applicants may wish to approach AstraZeneca as a project partner for which they could provide advice, data, other forms of in kind support and in-part funding, as appropriate. Please contact Jason Snape ([Jason.Snape@astrazeneca.com](mailto:Jason.Snape@astrazeneca.com)).

##### Scottish Salmon Producers' Organisation

Where proposals have any relevance to Scottish salmon aquaculture, applicants may wish to approach SSPO as a project partner for which they could provide knowledge, access to information and resources. Please contact Dr John L Webster, Technical Director ([JWebster@scottishsalmon.co.uk](mailto:JWebster@scottishsalmon.co.uk)).

##### Water Industry Research Group

Where proposals cover aspects of wastewater discharges, applicants may wish to approach UK Water Industry Research ("UKWIR") to identify a possible project partner from the UK sewerage companies. Such partners may be able to offer access to sites, advice, data, and other forms of in kind support, as appropriate. Hans Jensen is Chief Executive of UKWIR, and the programme lead for wastewater is Howard Brett ([howard.brett@thameswater.co.uk](mailto:howard.brett@thameswater.co.uk)).

#### *Government departments and agencies*

##### Defra

Defra have interest across all environment, animal and food sectors, as well as the growth agenda and ensuring that nothing impacts on that. For proposals of relevance to this they could provide access to decision makers, policy advisers and help steer projects and outcomes. They could also facilitate access to other government departments and regulatory agencies and provide links to the devolved administrations and Europe. Please contact Elaine Connolly ([elaine.connolly@defra.gsi.gov.uk](mailto:elaine.connolly@defra.gsi.gov.uk)).

##### Environment Agency

The Environment Agency regulate intensive farming, the spreading of material to land (e.g. sewage sludge, digestate, animal by-product treated material) and the discharge of treated wastewater to

water bodies. Where proposals seek to further our understanding of the emergence, dissemination and impact upon environmental quality and health of antimicrobials, antibiotic residues, antimicrobial resistant bacteria and genes from such activities, applicants may approach the Environment Agency as a project partner. In addition to being an end-user of the information, they could facilitate access to pig and poultry sites, provide technical expertise, access to data and other forms of in kind support, as appropriate. Please contact Alwyn Hart ([alwyn.hart@environment-agency.gov.uk](mailto:alwyn.hart@environment-agency.gov.uk)).

#### Food Standards Agency (FSA)

The FSA is commissioning a systematic review on the contribution that food makes to AMR which it hopes will report in early 2016. The FSA would be interested to hear from applicants to this call who may be considering proposals which have the potential to address key evidence gaps in this area. Please contact Alisdair Wotherspoon in the first instance ([Alisdair.wotherspoon@foodstandards.gsi.gov.uk](mailto:Alisdair.wotherspoon@foodstandards.gsi.gov.uk)).

#### Natural England

Of England's 224 National Nature Reserves (NNRs), Natural England are responsible for the management of 143 sites directly, 23 of which are managed in partnership or in various forms of shared management with Approved Bodies. Almost the entire NNR area is SSSI (over 99% by area) and 84% of NNRs are also either SAC or SPA (or both). Natural England are offering their 143 NNRs as potential sample sights as part of this call. This would provide researchers with a range of environments from the relatively wild uplands of northern Pennines to coastal sites. Some sites are actively managed with stock, whilst others are not. For more information please contact Dave Stone, [Dave.Stone@naturalengland.org.uk](mailto:Dave.Stone@naturalengland.org.uk).